

polymers: modified polyethylene (modified by acrylic acid, maleic anhydride or other materials), grafted polypropylene, polyamide, polyurethane.

5 The properties of the laminated composite 11 obtained by the process using the second method of implementation allow cutting without any fracture and without any undesirable stresses being produced in the strips of nanocrystalline material.

10 Instead of self-adhering or thermoplastic covering strips, it is possible to produce laminates or composites according to the invention by a process of coating the faces of one or more nanocrystalline strips with adhesive. A non-tacky reactive adhesive material with a thickness of between 1 and 50 microns is then  
15 used.

An adhesive is called a reactive or two-stage adhesive when it is possible to carry out on this adhesive two successive polymerization or crosslinking reactions. Such a material is called a non-tacky  
20 material because it does not adhere after the first crosslinking reaction.

This adhesive may be chosen from thermosetting or thermoplastic polymers, depending on the desired magnetic properties of the magnetic component to be  
25 produced from the laminate or composite. These magnetic properties may in fact depend on the thermal conditions imposed on the laminate or composite during its manufacture.

Figure 3 shows schematically a plant for  
30 manufacturing a laminated material comprising a nanocrystalline strip by a process of coating the faces of the nanocrystalline strip directly with adhesive using a reactive adhesive.

The nanocrystalline strip 1, which preferably  
35 comes from a reel, is deposited on a support band 12, preferably made in the form of a flexible band movable in the direction indicated by the arrow 12'. Located above the movable support band 12 are a first coating unit 14a and a first drying and crosslinking unit 15a,

through which units the strip 1 of nanocrystalline alloy supported by the support band 12 is moved in the direction of the arrow 12'. A coating layer 13 is deposited on the upper side of the nanocrystalline strip 1 inside the first coating unit 14a. This coating layer 13 is dried and crosslinked in the first drying and crosslinking unit 15a.

The strip 1 of nanocrystalline alloy, coated with the layer 13 of plastic which adheres to its upper side, may be handled without any risk of fracture. It is therefore possible to make the strip 1 coated with the coating layer 13 pass from the support band 12 to a second coating unit 14b for depositing, on the second or lower side of the strip 1, a second coating layer 13' which is dried and crosslinked in a second drying and crosslinking unit 15b through which the strip coated on both its sides is made to run.

After leaving the plant shown in figure 3, a laminated strip 16 is obtained which comprises the nanocrystalline central strip 1 coated on both its sides with coating layers 13 and 13' made of a crosslinked polymer material.

The nanocrystalline strip, coated on both its sides with perfectly adhesive layers of plastic no longer exhibits brittle behavior and can be cut into the form of magnetic components of complex shapes.

As may be seen in figure 4, it is also possible to combine several laminated strips 16a, 16b, 16c similar to the laminated strip 16 in order to obtain a composite strip by superposition and adhesion of the laminated strips 16a, 16b and 16c.

A laminated composite strip could also be obtained by stacking strips of nanocrystalline alloy covered only on one side.

The strips 16a, 16b and 16c may be made to pass through a heating chamber 18 for raising them to a temperature of less than 400°C. The heated strips 16a, 16b and 16c are then pressed between two press rolls 19a and 19b, thereby allowing the strips 16a, 16b and

16c which include thermoplastic polymers to be bonded to one another. The composite strip 17 obtained is cooled in a cooling unit 20.

5 In a subsequent step of the treatment process according to the invention, magnetic components may be cut from the composite strip 17 without the nanocrystalline strips constituting the composite 17 fracturing.

10 The first step, consisting in producing the laminate 16 by depositing polymer layers on one or both sides of a nanocrystalline strip, may be carried out not only by coating, as indicated above, but also by spraying a polymer covering substance on one side of the strip, or each side of the strip in succession. The  
15 covering substance is then polymerized. It would also be possible to coat both sides of the nanocrystalline strip in a single step by dipping. However, it would then be more tricky to handle the nanocrystalline strips.

20 To carry out the process according to the invention with direct adhesive coating of the nanocrystalline strip, it is possible to use a polymer of one of the following types: acrylic material, polyester, epoxy resin, phenolic epoxy resin,  
25 polyester/epoxy resin, phenolic resin with modifier, polyurethane/polyester resin. The covering layer made of polymer material may have a thickness of 1 to 50  $\mu\text{m}$ .

In all the cases envisaged above, a laminated or composite strip comprising one or more  
30 nanocrystalline strips is obtained, each nanocrystalline strip being covered on one or both of its sides with a polymer layer. Consequently, it is possible to cut magnetic components from the laminated or composite strips without any risk of the  
35 nanocrystalline strips fracturing.

If it is desired to manufacture magnetic components of the toric type with a narrow hysteresis loop, that is to say the  $B_r/B_s$  ratio of which is very much less than 1, the components will be cut out so as